

WHAT IS CLAIMED IS:

1                    1.        A method for determining whether a MEMS device is in a select state  
2 defined by a position of a moveable element comprised by the MEMS device, the method  
3 comprising:  
4                    changing a voltage of a first region of a sensing configuration; and  
5                    measuring a second region of the sensing configuration,  
6                    wherein the first and second electrically active regions are electrically coupled  
7 when the MEMS device is in the select state and electrically uncoupled when the MEMS  
8 device is not in the select state.

1                    2.        The method recited in claim 1 wherein the sensing configuration  
2 comprises a transistor.

1                    3.        The method recited in claim 2 wherein the sensing configuration  
2 comprises a field-effect transistor having a source region corresponding to the first region and  
3 a drain region corresponding to the second region.

1                    4.        The method recited in claim 2 wherein the sensing configuration  
2 comprises a bipolar junction transistor having an emitter region corresponding to the first  
3 region and a collector region corresponding to the second region.

1                    5.        The method recited in claim 1 wherein:  
2                    the first and second regions comprise first and second waveguide ports; and  
3                    measuring the second region comprises measuring an impedance between the  
4 first and second waveguide ports.

1                    6.        The method recited in claim 1 wherein the moveable element is not in  
2 contact with the first or second regions when in the position defining the select state.

1                    7.        The method recited in claim 1 wherein the moveable element is in  
2 contact with the first and second regions when in the position defining the select state.

1                    8.        The method recited in claim 7 wherein the first and second regions  
2 comprise electrically conductive regions.

1                   9.     The method recited in claim 1 further comprising performing changing  
2 the voltage and measuring the second region periodically.

1                   10.    The method recited in claim 9 further comprising periodically restoring  
2 a voltage to an electrode configured to provide an electrostatic force on the moveable  
3 element.

1                   11.    The method recited in claim 1 wherein changing the voltage of the first  
2 region comprises applying an ac voltage spike to the first region.

1                   12.    A MEMS device comprising:  
2 a moveable element configured to move to a position defining a select state of  
3 the MEMS device upon activation of an electrode;  
4 a sensing configuration having first and second regions, wherein the first and  
5 second regions are electrically coupled when the moveable element is in the position and  
6 electrically uncoupled when the moveable element is not in the position; and  
7 a detector configured to indicate when the first and second regions of the  
8 sensing configuration are electrically coupled.

1                   13.    The MEMS device recited in claim 12 wherein the sensing  
2 configuration comprises a transistor.

1                   14.    The MEMS device recited in claim 13 wherein:  
2 the sensing configuration comprises a field-effect transistor;  
3 the first region comprises a source of the field-effect transistor; and  
4 the second region comprises a drain of the field-effect transistor.

1                   15.    The MEMS device recited in claim 13 wherein:  
2 the sensing configuration comprises a bipolar junction transistor;  
3 the first region comprises an emitter of the bipolar junction transistor; and  
4 the second region comprises a collector of the bipolar junction transistor.

1                   16.    The method recited in claim 12 wherein the first and second regions  
2 comprise first and second waveguide ports.

1                   17.     The method recited in claim 12 wherein the moveable element is in  
2     contact with the first and second regions when in the position.

1                   18.     The MEMS device recited in claim 12 further comprising a dynamic  
2     refresh driver electrically coupled with the first region and configured to periodically provide  
3     an ac signal to the first region.

1                   19.     A microstructure for steering light, the microstructure comprising:  
2             a substrate;  
3             a structural linkage connected with the substrate and supporting a moveable  
4     element disposed to orient a reflective coating;  
5             an electrode disposed to provide an electrostatic force on the moveable  
6     element upon actuation; and  
7             a sensing configuration having first and second regions that are electrically  
8     coupled only when the moveable element is in a position that defines a select state for the  
9     microstructure.

1                   20.     The microstructure recited in claim 19 wherein the sensing  
2     configuration comprises a transistor formed within the substrate.

1                   21.     The microstructure recited in claim 20 wherein:  
2             the sensing configuration comprises a field-effect transistor;  
3             the first region comprises a source of the field-effect transistor; and  
4             the second region comprises a drain of the field-effect transistor.

1                   22.     The microstructure recited in claim 20 wherein:  
2             the sensing configuration comprises a bipolar junction transistor;  
3             the first region comprises an emitter of the bipolar junction transistor; and  
4             the second region comprises a collector of the bipolar junction transistor.

1                   23.     The microstructure recited in claim 19 wherein the first and second  
2     regions comprise first and second waveguide ports.

1                   24.     The microstructure recited in claim 19 wherein the moveable element  
2     is in contact with the first and second regions when in the position.

1                   25.     The microstructure recited in claim 19 wherein the microstructure is  
2     one of a plurality of similar microstructures comprised by an array.

1                   26.     The microstructure recited in claim 25 wherein:  
2                   the first region of each of the microstructures is electrically coupled with a  
3     dynamic refresh driver;  
4                   the electrode of each of the microstructures is electrically coupled with the  
5     dynamic refresh driver; and  
6                   the second regions of the microstructures are electrically coupled with one  
7     another.

1                   27.     The microstructure recited in claim 26 wherein the array is comprised  
2     by a wavelength router.